

WE CLAIM:

1. A method for processing of natural gas comprising the steps of:  
introducing a gaseous natural gas stream comprising a mixture of hydrocarbons into a vortex tube, forming a hot fluid stream and a cold fluid stream;  
introducing said cold fluid stream into an upper section of a distillation column; and  
introducing said hot fluid stream into a lower section of said distillation column, separating heavier hydrocarbon components from lighter hydrocarbon components disposed in said natural gas stream.
2. A method in accordance with Claim 1, wherein said mixture of hydrocarbons comprises hydrocarbons selected from the group consisting of methane, ethane, propane, butane and natural gasoline.
3. A method in accordance with Claim 1, wherein said gaseous natural gas stream is introduced into a plurality of said vortex tubes.
4. A method in accordance with Claim 3, wherein said gaseous natural gas stream is introduced into each of said vortex tubes in sequence.

5. A method in accordance with Claim 4, wherein flow of said gaseous natural gas stream through each of said vortex tubes is controlled by a plurality of pressure control valves, each of said pressure control valves connected to a vortex tube outlet of a corresponding said vortex tube.

6. A method in accordance with Claim 5, wherein said plurality of pressure control valves are opened and closed in sequence, thereby enabling sequential flow and sequential flow interruption through said plurality of vortex tubes.

7. A system for natural gas processing comprising:  
at least one vortex tube having a gaseous natural gas stream inlet, a hot fluid stream outlet and a cold fluid stream outlet; and  
at least one distillation column having a hot fluid stream inlet in fluid communication with said hot fluid stream outlet and having a cold fluid stream inlet in fluid communication with said cold fluid stream outlet.

8. A system in accordance with Claim 7, wherein each said vortex tube is designed for a volume of gaseous natural gas stream flowthrough that is dependent upon a set pressure drop across said vortex tube.

9. A system in accordance with Claim 7 further comprising a flow control valve in fluid communication with each of said vortex tubes.

10. A system in accordance with Claim 9, wherein said flow control valve is a block valve having a valve outlet in fluid communication with said gaseous natural gas stream inlet.

11. A system in accordance with Claim 9, wherein said flow control valve is a pressure control valve having a fluid inlet in fluid communication with one of said hot fluid stream outlet and said cold fluid stream outlet.

12. A system in accordance with Claim 7, wherein said cold fluid stream inlet is disposed in an upper section of said distillation column and said hot fluid stream inlet is disposed in a lower section of said distillation column.

13. A method for processing a gaseous stream comprising the steps of:

introducing a gaseous stream comprising a mixture of components to be separated into a vortex tube, forming a hot fluid stream and a cold fluid stream;

introducing said cold fluid stream into an upper section of a distillation column; and

introducing said hot fluid stream into a lower section of said distillation column, separating a first portion of said components from a second portion of said components disposed in said gaseous stream.

14. A method in accordance with Claim 13, wherein said gaseous stream comprises gas comprising heavier hydrocarbon components and lighter hydrocarbon components.

15. A method in accordance with Claim 13, wherein said gaseous stream is introduced into a plurality of said vortex tubes.

16. A method in accordance with Claim 15, wherein said gaseous stream is introduced into each of said vortex tubes in sequence.

17. A method in accordance with Claim 16, wherein flow of said gaseous stream through each of said vortex tubes is controlled by a plurality of pressure control valves, each of said pressure control valves connected to a vortex tube outlet of a corresponding said vortex tube.

18. A method in accordance with Claim 17, wherein said plurality of pressure control valves are opened and closed in sequence, thereby enabling sequential flow and sequential flow interruption through said plurality of vortex tubes.